



NETworks[®] ATMS

California 511 Workshop #8
Acquiring Flow Data for
Urban Arterials, Rural Highways

Presented by:
Dan Lukasik, P.E.
Delcan Corporation

October 27, 2008



Presentation Overview

- ▶ NETworks® Description
- ▶ Where is it being used?
- ▶ System Modules
- ▶ Data Collection
- ▶ Data Dissemination



Description

- ▶ Delcan's custom developed software application used for Advanced Transportation Management
 - Web-based, Customizable Application
 - Collects data from numerous different sensors and sources
 - Operates as freeway, arterial/signal, transit, emergency operations, and ATIS/511 system
- ▶ Interfaces and Integrates multiple transportation systems
 - Freeway, Arterial, Transit, Emergency and Weather Management Systems



networks

Who is using NETworks®?

NETworks R5

OCTA 91 Express Lanes

Caltrans District 10

Southbay Expressway

Caltrans D4 (C2C/511)

Nebraska Statewide ATMS

NHDOT Statewide ATMS

Michigan Statewide ATMS

Illinois AMBER Alert

MoDOT Statewide

East St. Louis

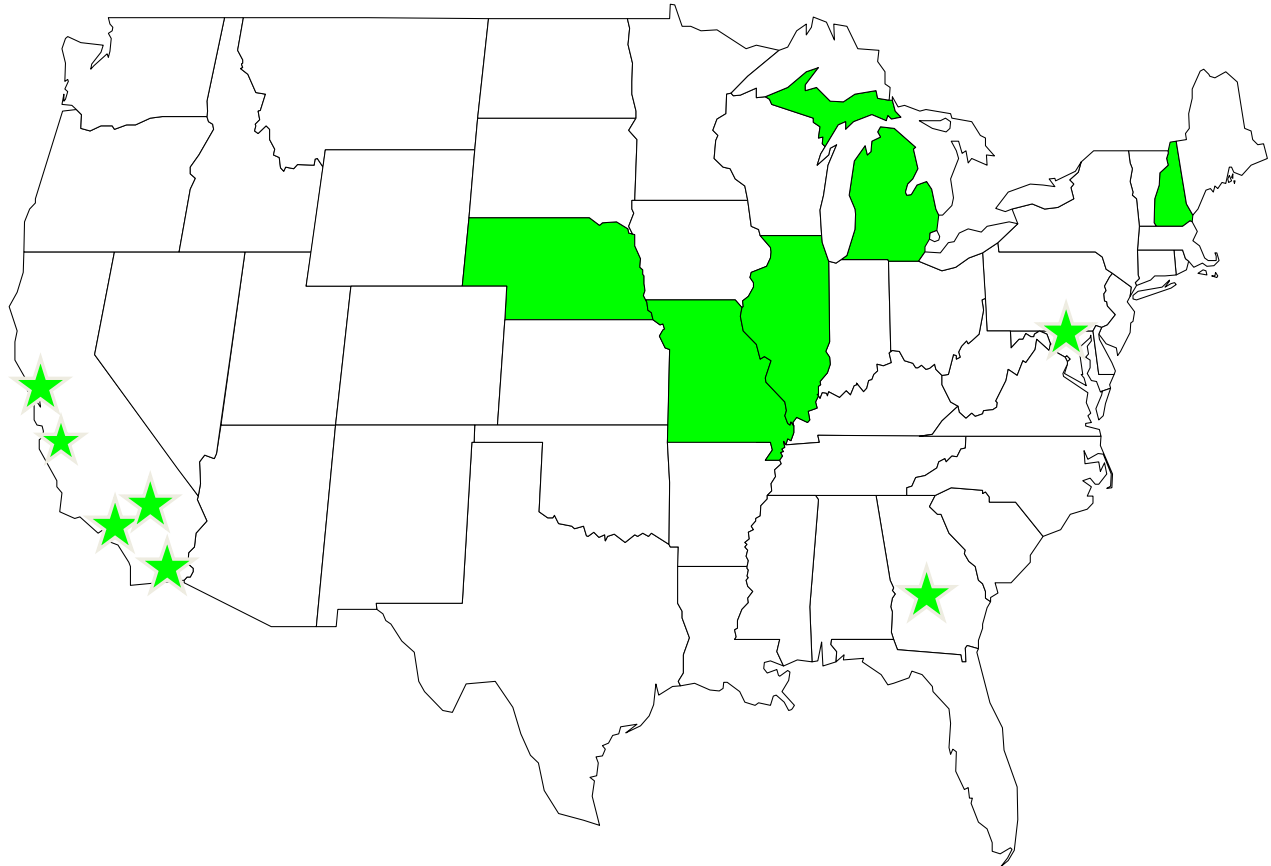
Greece (Thessaloniki)

Durban South Africa

Cyprus ATMS

Baltimore MMTIS

Georgia



Delcan Proprietary

Delcan
TRANSPORTATION • INFORMATION TECHNOLOGY • WATER



Modules

NETworks® is purchased and deployed in a modular fashion. Users can purchase a license with one or more modules and have it customized to their specific needs.

Map	Admin	Security	Video	DMS	RWIS/ESS	VDS	ATIS/511	C2C
Data Archiving & Reporting	Event Management	Response Plans	Congestion Signing	AVL	HAR	Traffic Signal	PDA	Ramp Metering

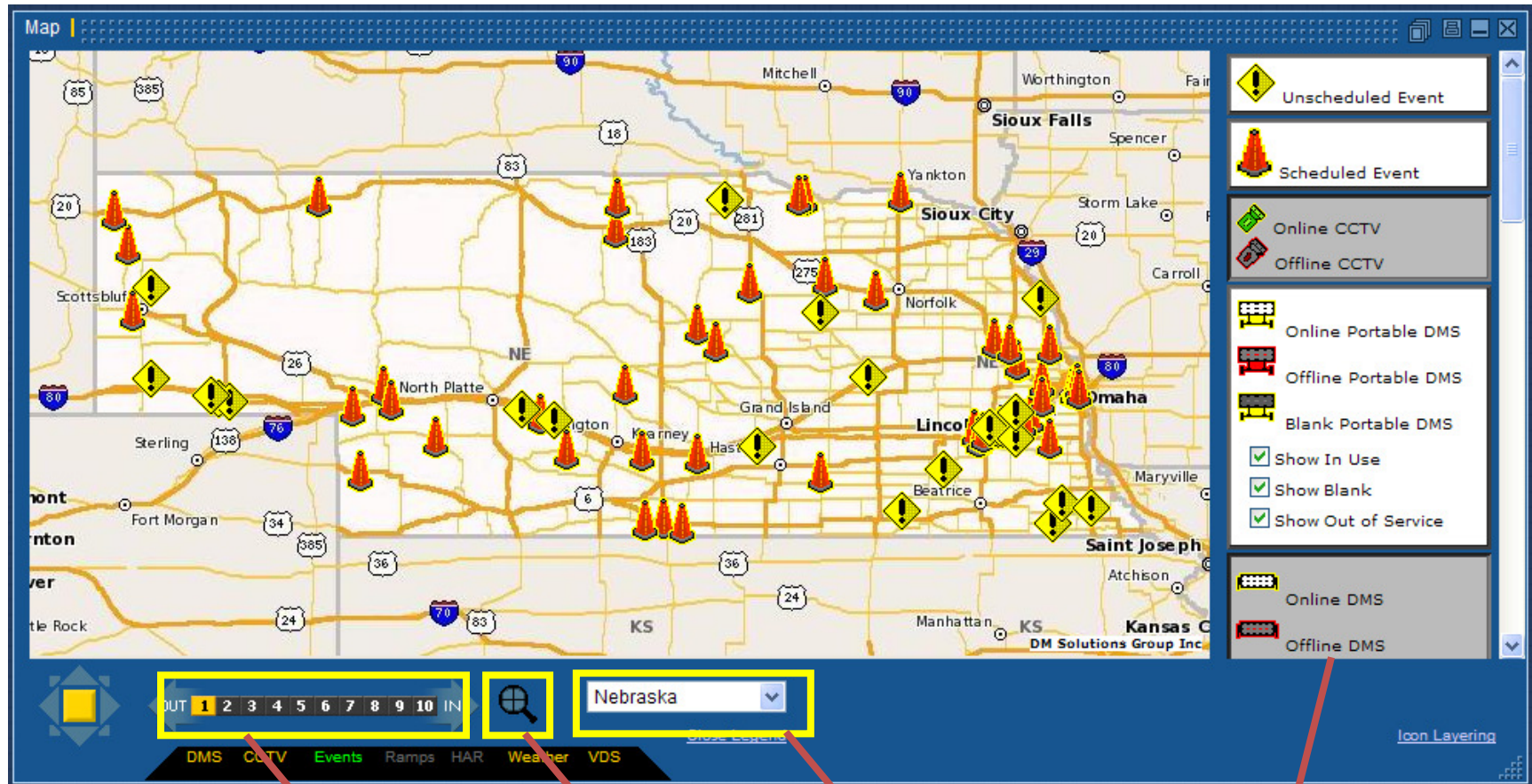
Communication Layer

Web-based User Interface

Base Architecture Hardware and Software



Map/GUI



Ten (10)
Selectable
Zoom Levels

Rectangle
Zoom

Preset Zoom
Levels

Hideable
Legend with
Icon Layer
Selection

Delcan Proprietary

Delcan
TRANSPORTATION • INFORMATION TECHNOLOGY • WATER



CCTV Control

View and control 8+ CCTV cameras simultaneously via web

- Set presets
- Video Wall Control

- Image Hover/Drag/Slide CCTV Control

http://10.87.0.101 - ATMS - Microsoft Internet Explorer

NETworks HTMS

New | Map | Viewer | List | Library | Inventory | Video Wall | Reporting | Administration | About | Logout

Map

Chino Hills State Park
Featherly Regional Park
Green River Golf
Weir Canyon Regional Park

DM Solutions Group Inc.

91 Express Lanes

Viewer

CCTV ID# CAM-29

Status: OK Location: 91 West at Gypsum Cyn

Zoom Focus Iris Open Presets

Select a CCTV

DMS CCTV Events Ramps HAR Weather

Viewer

CCTV ID# CAM-04

Status: OK Location: 91 West at Rte. 55 Co

Zoom Focus Iris Open Presets

Select a CCTV

DMS CCTV Events Ramps HAR Weather

Viewer

CCTV ID# CAM-33

Status: OK Location: 91 East at 1

Zoom Focus Iris Open Presets

Select a CCTV

DMS CCTV Events Ramps HAR Weather

Viewer

CCTV ID# CAM-15

Status: OK Location: 91 East at 1

Zoom Focus Iris Open Presets

Select a CCTV

DMS CCTV Events Ramps HAR Weather

List

Type	ID	Roadway	Cross Street	Mile Marker	City
	CAM-01	91 East	Tustin Ave.	8.36	Anaheim
	CAM-02	91 East	Rte. 55 Connector	8.6	Anaheim
	CAM-03	91 West	Rte. 55 Connector	8.8	Anaheim
	CAM-04	91 West	Rte. 55 Connector	8.8	Anaheim
	CAM-05	91 West	somewhere	17.0	Anaheim

All DMS CCTV Events Ramps HAR Weather

Done

Internet

start | ATMS Login - Microso... | http://10.87.0.101 - ... | Paint Shop Pro

5:23 PM



DMS Control

**DMS Control
and DMS
message
library screens**

Viewer | [Grid Icon] [Max Icon] [Close Icon]

DMS ID# 13

ROADWORK CONSTRUCTION
TEST MESSAGE 10 P2

Status: OK Location: I-5 North at Westcheste

Phase 1

Phase 2

Phase 3

Phase Timer

16: I-2 South at Elm

DMS CCTV Events Ramps HAR Weather

Library | [Grid Icon] [Max Icon] [Close Icon]

DMS Messages [Edit Privilege](#)

	Message Title	Last Modified	Username
	DETOUR AHEAD	03/23/2007	
	EXPECT DELAYS	03/23/2007	
	LANES CLOSED AHEAD	03/23/2007	

Roadwork/Construction 3 of 20

Message Title

Phase 1

Phase 2

Phase 3

Phase Timer 2 Seconds

DMS HAR ResponsePlan

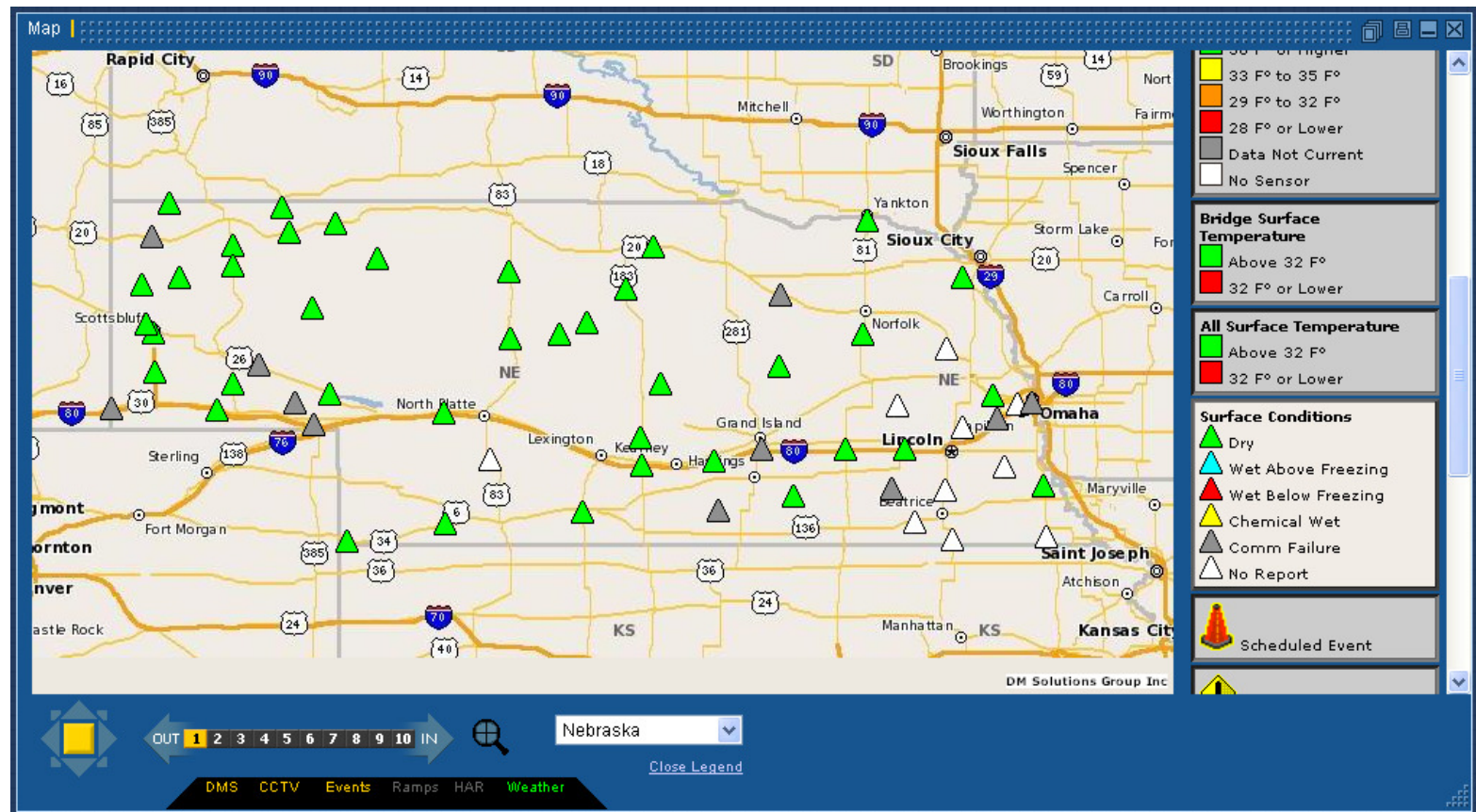
Delcan Proprietary

TRANSPORTATION • INFORMATION TECHNOLOGY • WATER



Weather Monitoring

- Polls data from weather sensors
- Monitors weather alarms
- Anti-icing control



Nebraska Weather Sensors (Surface Conditions Icons)



Weather Forecasting

Obtains weather information from the National Weather Service and other sources

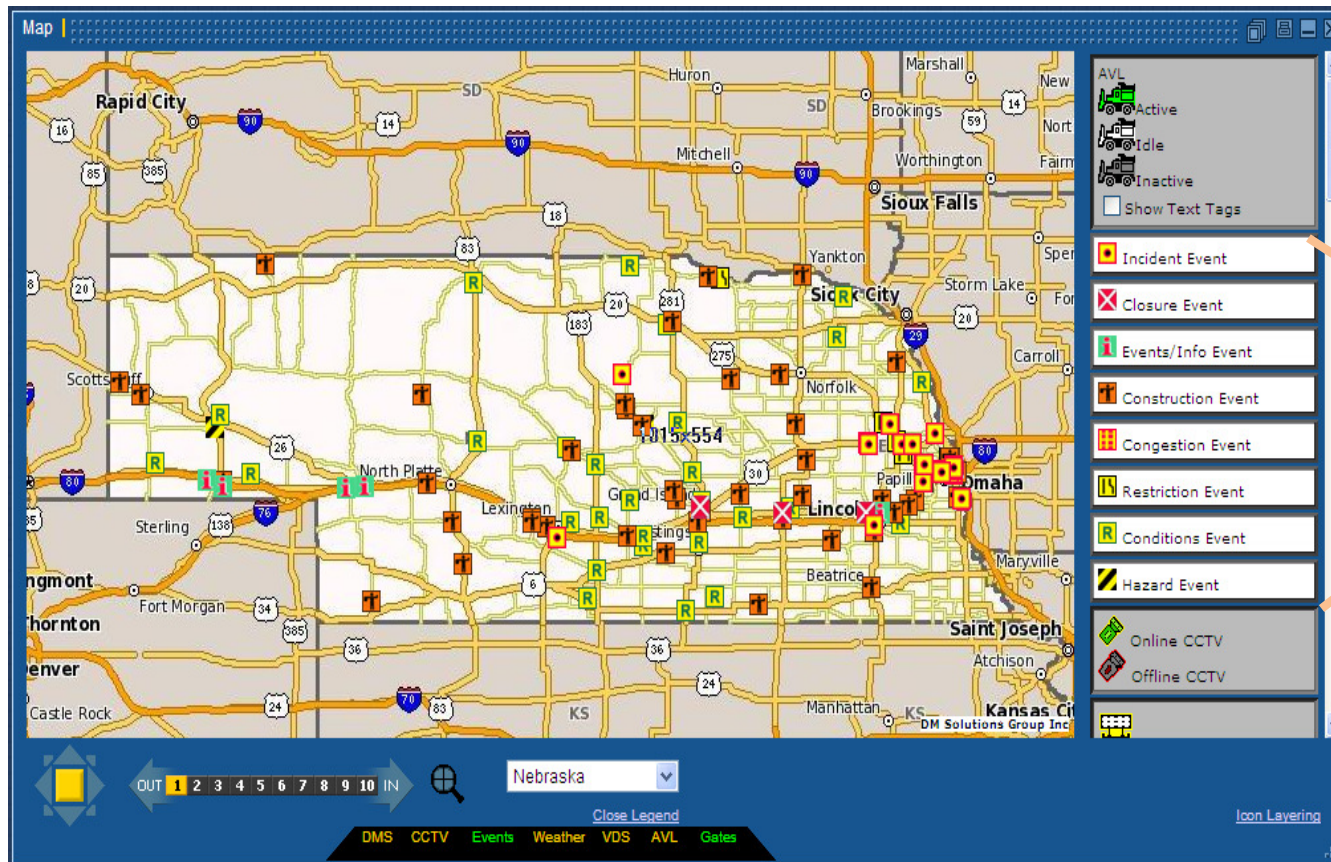


Delcan Proprietary





Event Managament



**Add any
different event
types or icons**

Delcan Proprietary



Event Response Plans

Viewer | EVENT ID# 100063

DMS Controls ● Contacts & Notifications

Close Response Plan

Event Type: Accident

Agency: NHDOT

Start Date/Time: 09-18-2007 11:40

Estimated Duration: 0 D 0 H 0 M

End Date/Time: 09-18-2007 11:40

Severity: ☒ Event last 30 mins or less
☐ Event last 90 mins or less
☐ Event last more than 90 mins

Lanes Blocked: ☐ LS ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ RS ☐ OR

Location Information

City/Town: Acworth

County: Belknap

State: NH

Primary Location

Roadway Type: Arterial

Roadway Name:

Direction: ☒ E ☐ N ☐ S ☐ W

Mile Marker: 0

Cross Street:

DMS Editor & Queue

CRASH ON I-20 EAST
4 LANES BLOCKED
EXPECT DELAYS

Status: OK Location: I-85 North at Clairmont

Override: EVENT 1, EVENT 2, EVENT 3, EVENT 4, EVENT 5, WIDE AREA, TRAVEL TIME, DEFAULT

Message Here: CRASH ON I-20 EAST ...
TRAFFIC RE-ROUTE ON I-20 ...
MESSAGE LINE HERE ...
ADDITIONAL MESSAGE HERE ...
THIS IS ONE MORE MESSAGE ...
IT IS COLD IN WINTER ...
25 MINUTES TO I-95 ...
CLICK IT OR TICKET ...

Related DMS List

Active	ID	DMS Location
<input type="checkbox"/>	DMS 001	I-20 E - Exit 4 Ramp
<input checked="" type="checkbox"/>	DMS 003	I-20 E - Exit 4 Overpass
<input checked="" type="checkbox"/>	DMS 125	I-20 W - Exit 3 Bridge
<input type="checkbox"/>	DMS 128	I-20 W - Exit 3 Ramp
<input checked="" type="checkbox"/>	DMS 131	I-20 W - Exit 3 Overpass

Geo-Locator Map

Concord

School

Select Area

OUT 1 2 3 4 5 6 7 8 9 10 IN

Response Plan Action: ☒ Recommend ☐ Activate ☐ Terminate

Cancel Save

Close Geo-Locator Map

DMS CCTV Events Ramps HAR Weather



Event Notification

**Sends e-mails,
text messages,
pages and phone
messages to the
designated
contact list
names and/or
groups**

Viewer | EVENT ID# 100063

● DMS Controls ● Contacts & Notifications [Recommend](#) [Close Response Plan](#)

Global Messaging

☒ CARS
☒ IEN

Notifications List

Include	Last	First	Title	Agency
<input type="checkbox"/>	Perez	Roberto	Office MGR	Delcan Corp.
<input checked="" type="checkbox"/>	Lick	Dave	Task Lead	Delcan Corp.
<input checked="" type="checkbox"/>	Clay	Hubert	PM	Delcan Corp.
<input type="checkbox"/>	Jansen	Dave	Tech Lead	Delcan Corp.
<input checked="" type="checkbox"/>	Ohman	RJ	GIS Master	Delcan Corp.

Contact List

Called	Ignored	Last	First	Title	Agency	Phone
<input checked="" type="radio"/>	<input type="radio"/>	Perez	Roberto	Office MGR	Delcan Corp.	404-320-1776
<input type="radio"/>	<input checked="" type="radio"/>	Lick	Dave	Task Lead	Delcan Corp.	404-320-1777
<input checked="" type="radio"/>	<input type="radio"/>	Clay	Hubert	PM	Delcan Corp.	404-320-1778
<input checked="" type="radio"/>	<input type="radio"/>	Jansen	Dave	Tech Lead	Delcan Corp.	404-320-1779
<input checked="" type="radio"/>	<input type="radio"/>	Ohman	RJ	GIS Master	Delcan Corp.	404-320-1780

Free Form Check List

Completed	Enter Free-Form Tasks Here	Comments
<input type="checkbox"/>		
<input type="checkbox"/>		
<input type="checkbox"/>		
<input type="checkbox"/>		
<input type="checkbox"/>		

Response Plan Action ● Activate ● Terminate [Cancel](#) [Save](#) [Open Geo-Locator Map](#)

DMS OCTV **Events** Ramps HAR Weather



Acquiring Flow and Congestion Data – Arterials and highways

1. Interfaces directly with Vehicle Detection Systems/Sensors (VDS)

- Inductive Loops
- Microloops (3M)
- RTMS Radar
- Wavetronix
- InfoTek ILDA
- Autoscope
- Sensys
- etc.

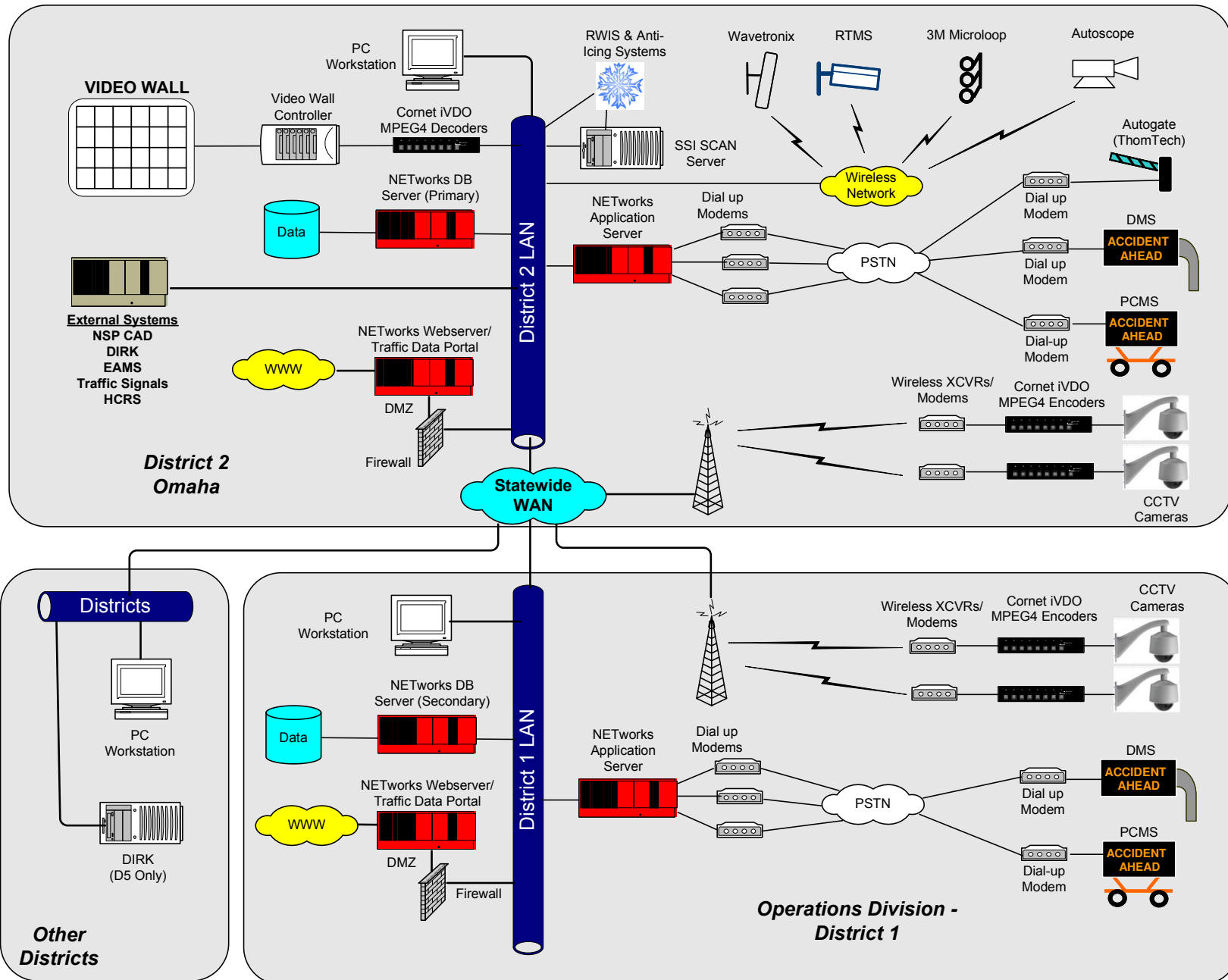
2. Interfaces with Sensor system via data collection subsystems (e.g. web services feeds)

- SpeedInfo
- Sensys Networks

3. Interfaces with vehicle probe system

- Cellular Probe Data
- Fleet Vehicle GPS Probe Data
- VII data sources (soon)
- Direct Fleet Vehicle Interfaces

Nebraska Department of Roads

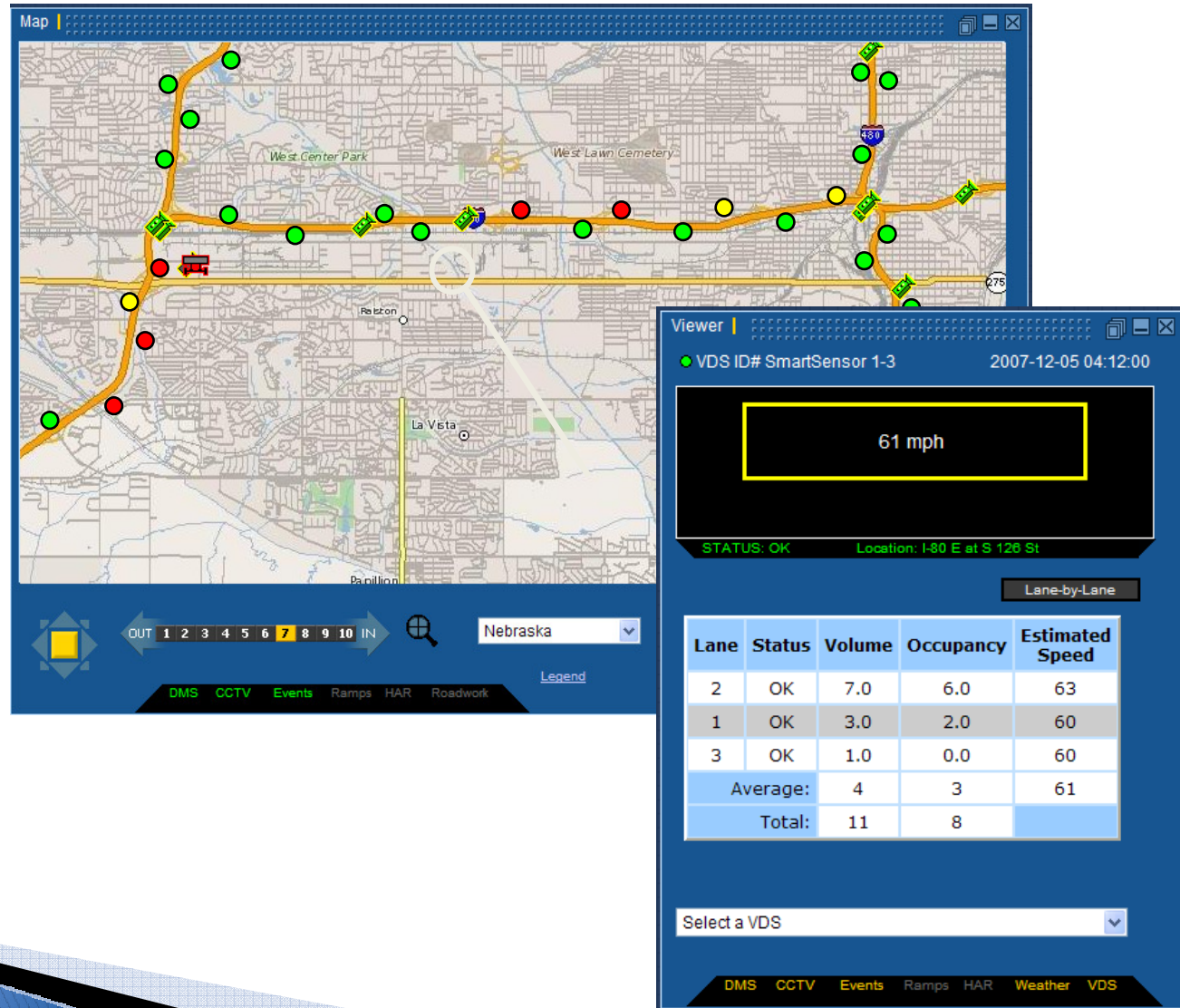




Vehicle Detector System (VDS) Module

Interfaces with multiple vehicle detection/road way monitoring devices

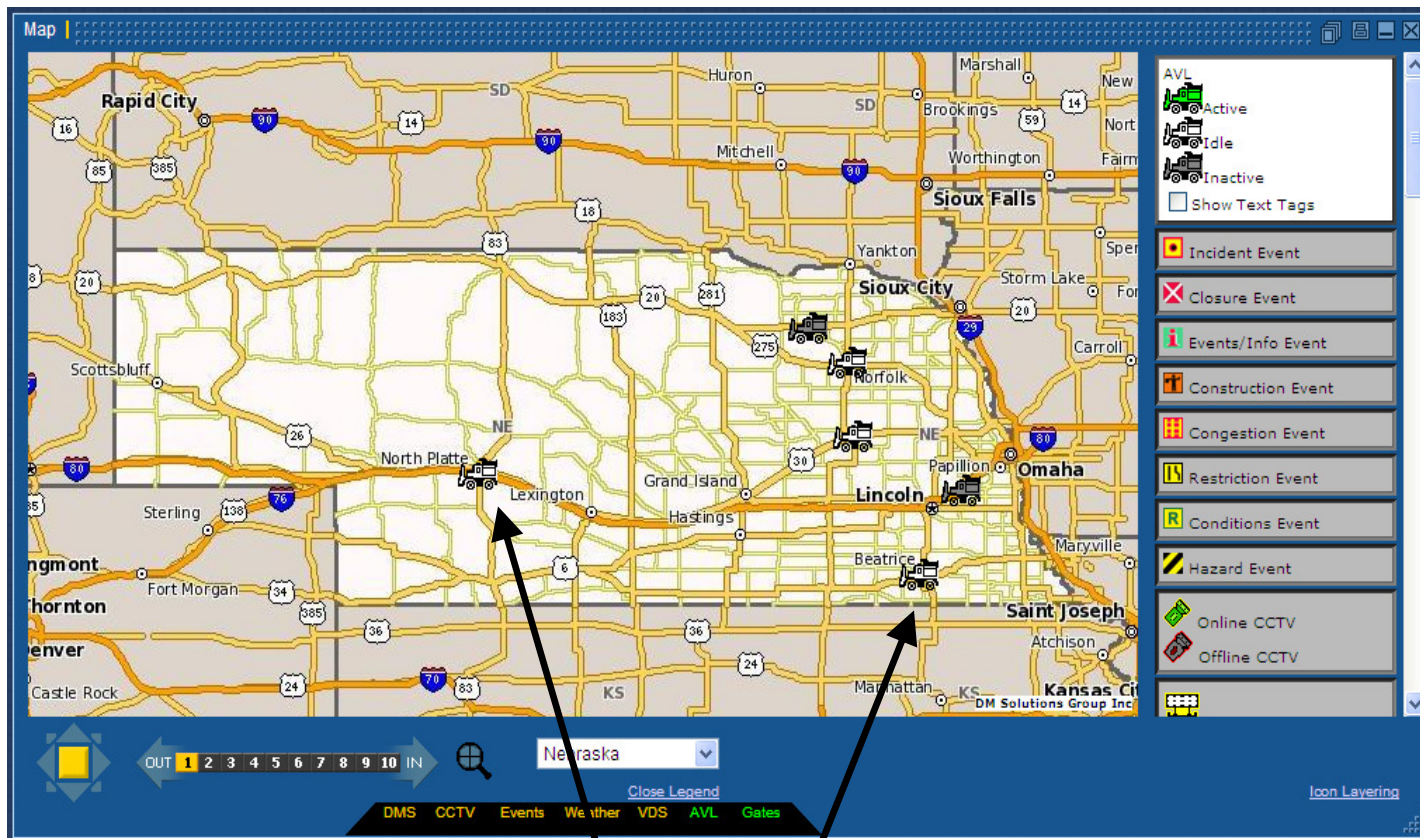
- Inductive Loops
- InfoTek ILDA
- Microloops
- RTMS
- Wavetronix
- Autoscope
- Sensys
- Speedinfo
- Cell probes
- GPS Probes
- etc.



Delcan Proprietary



Fleet Vehicle Tracking/AVL

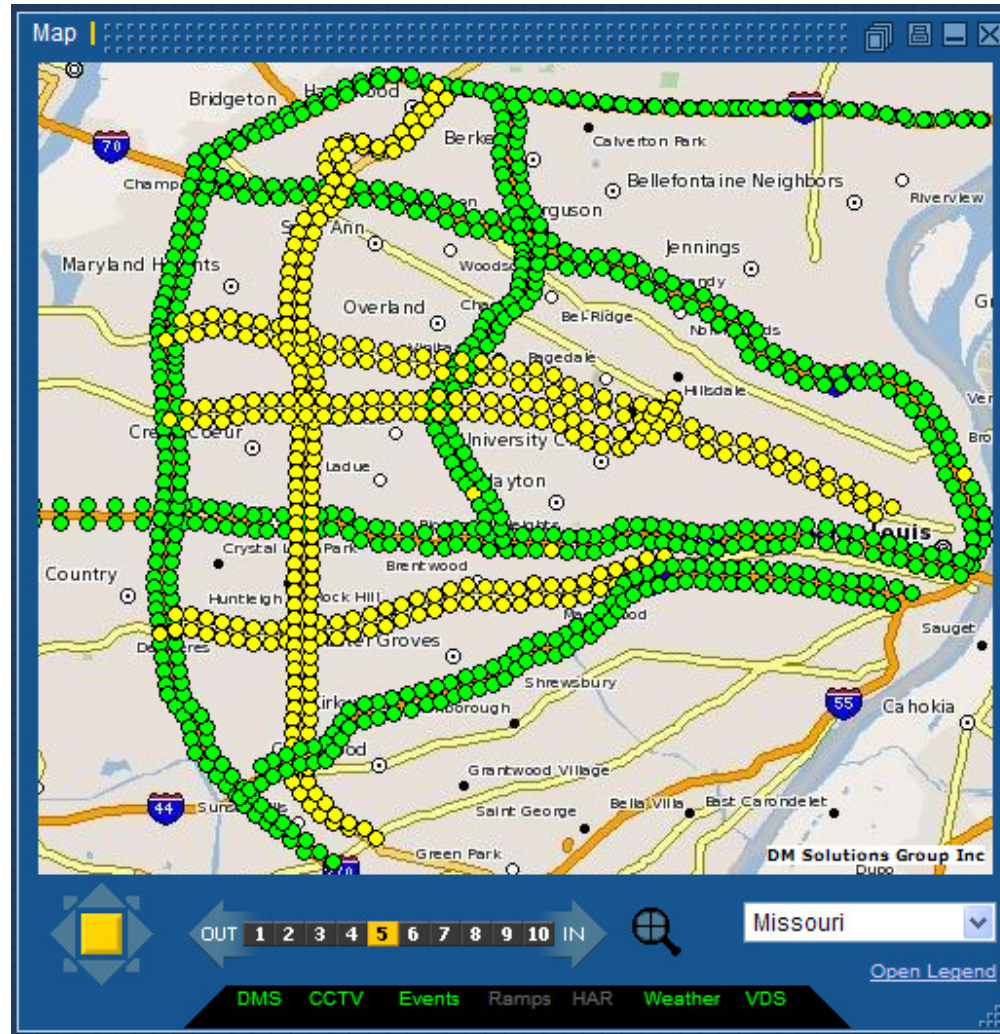


Track locations of fleet vehicles and their status information

Delcan Proprietary



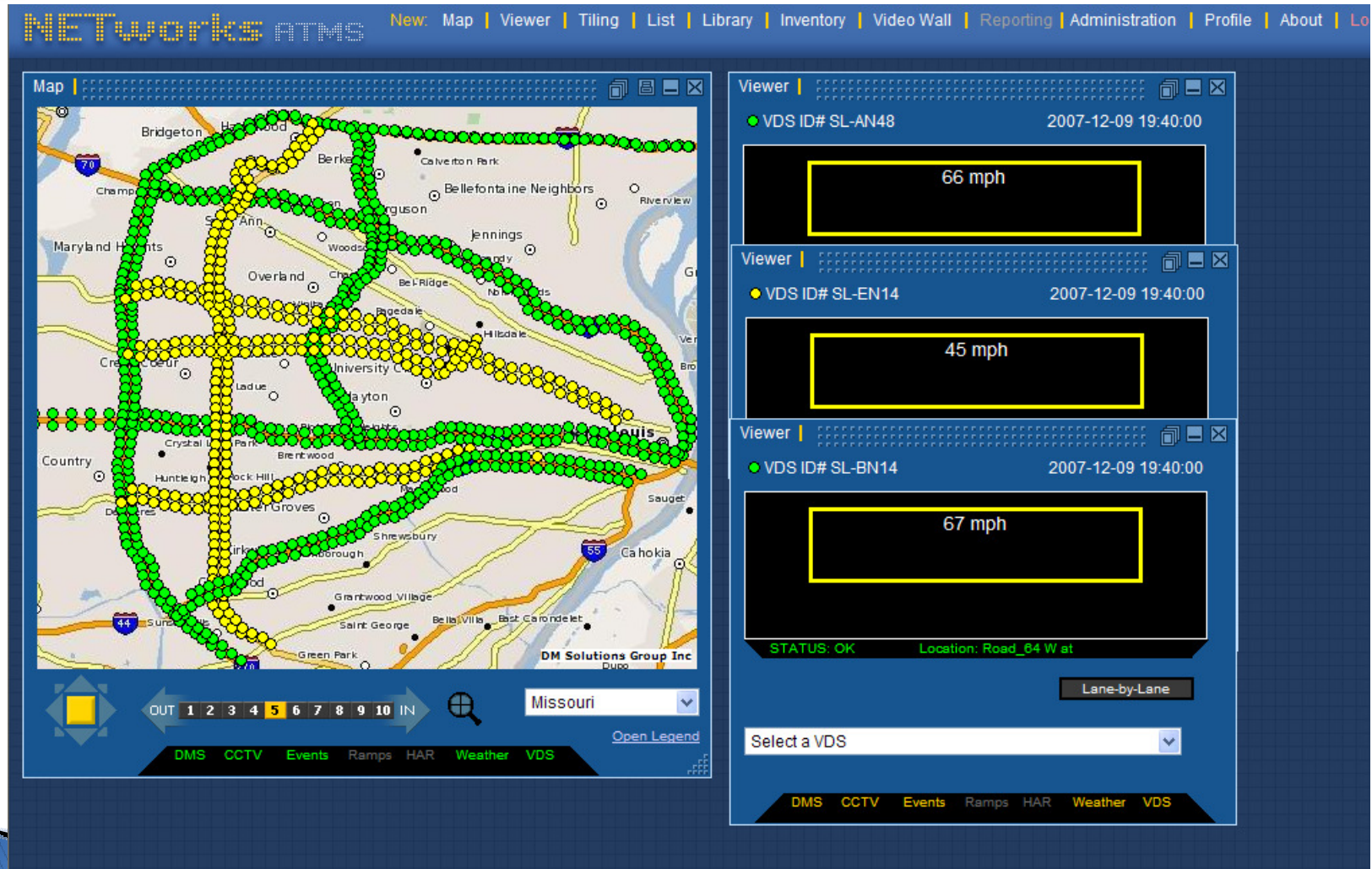
VDS Probe Point Data



Delcan Proprietary



VDS Probe Point Data



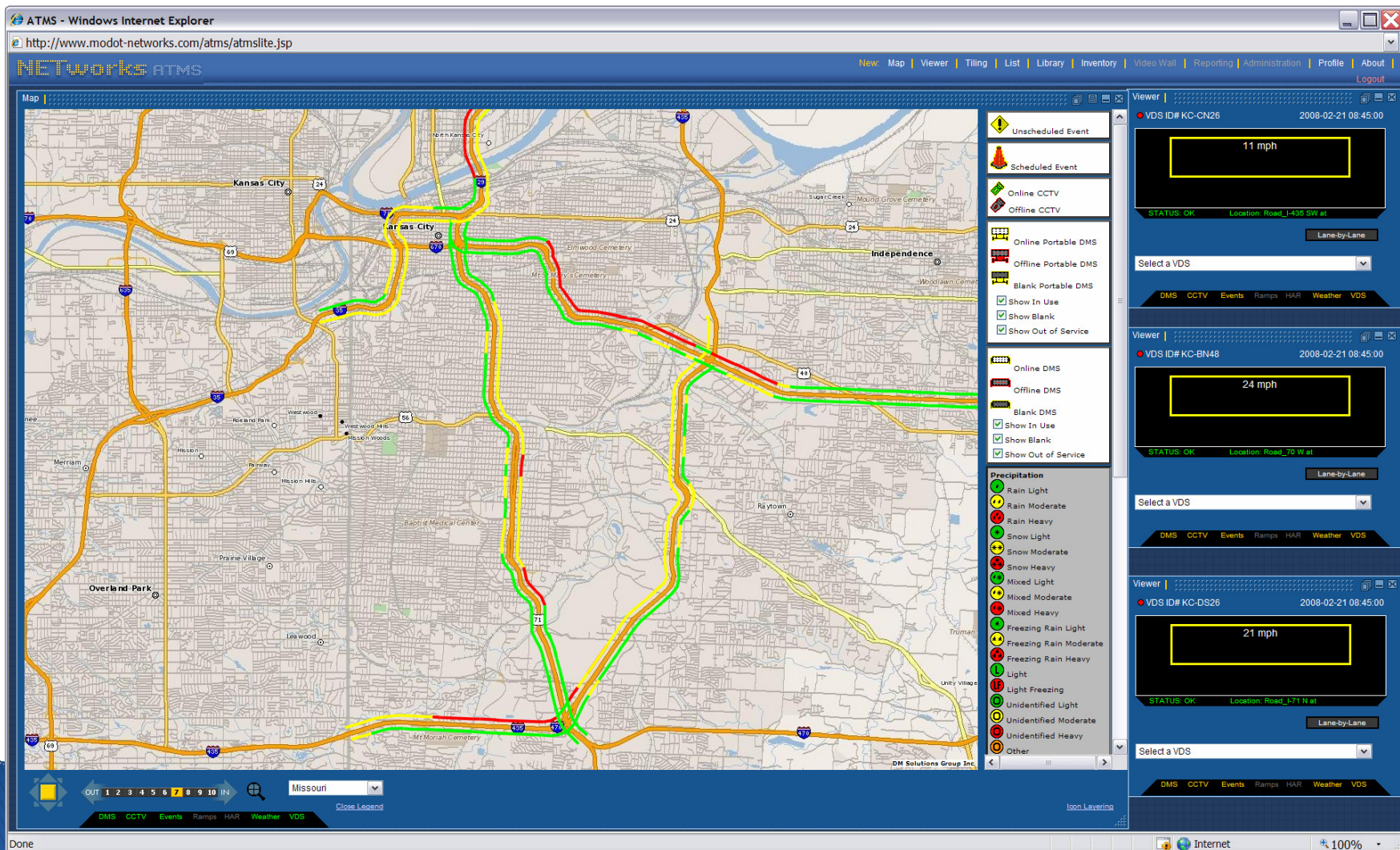
Delcan Proprietary





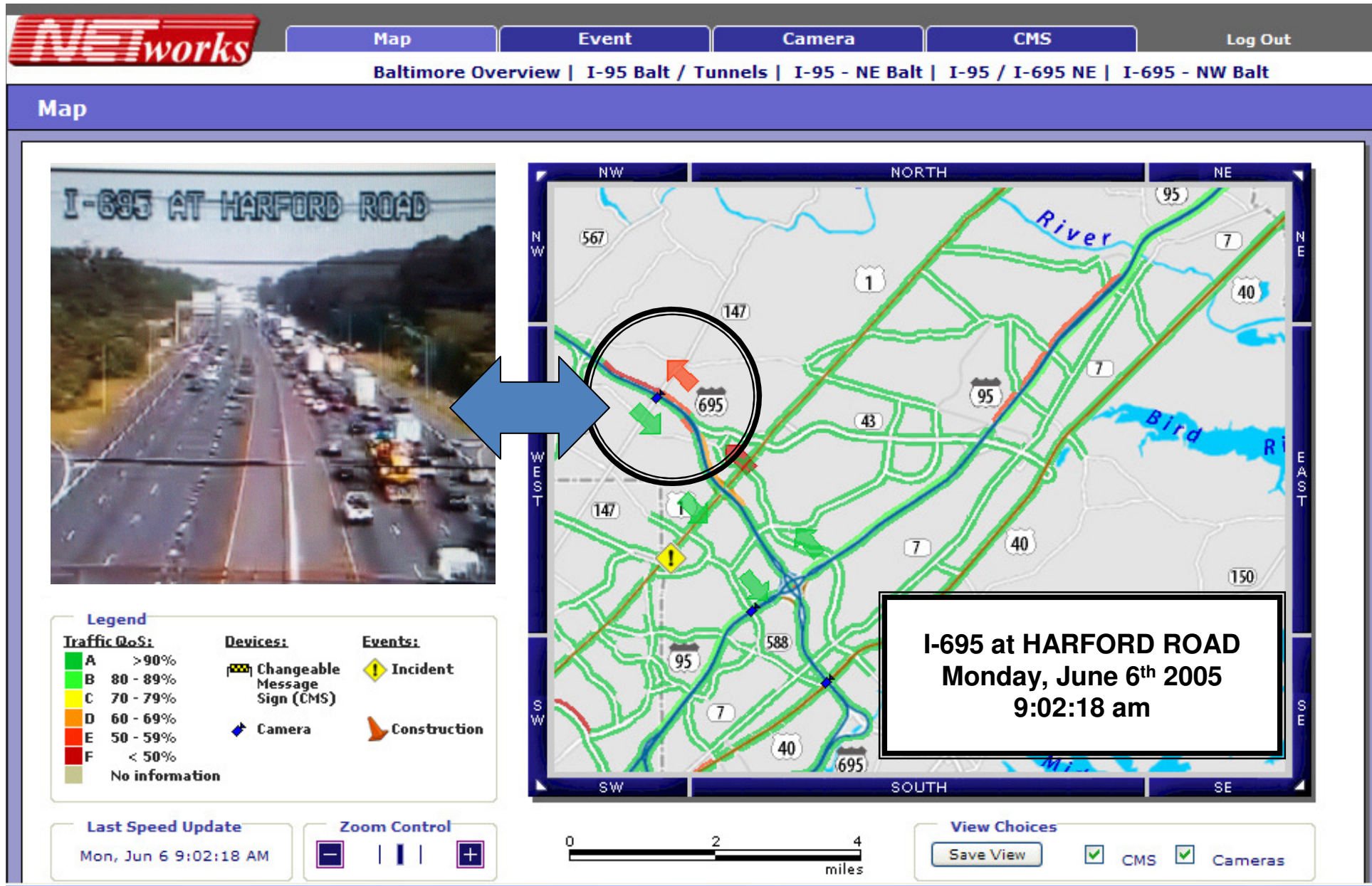


VDS Probe Segment Data (KC)



Delcan Proprietary

MARYLAND DOT CAMERAS SHOW ACCURACY OF TRAFFIC INFORMATION BEING CAPTURED USING CELL PROBES



CELL PROBES ACCURATELY UPDATE TRAFFIC CONDITIONS AS CHANGES OCCUR



NETworks

Map

Event

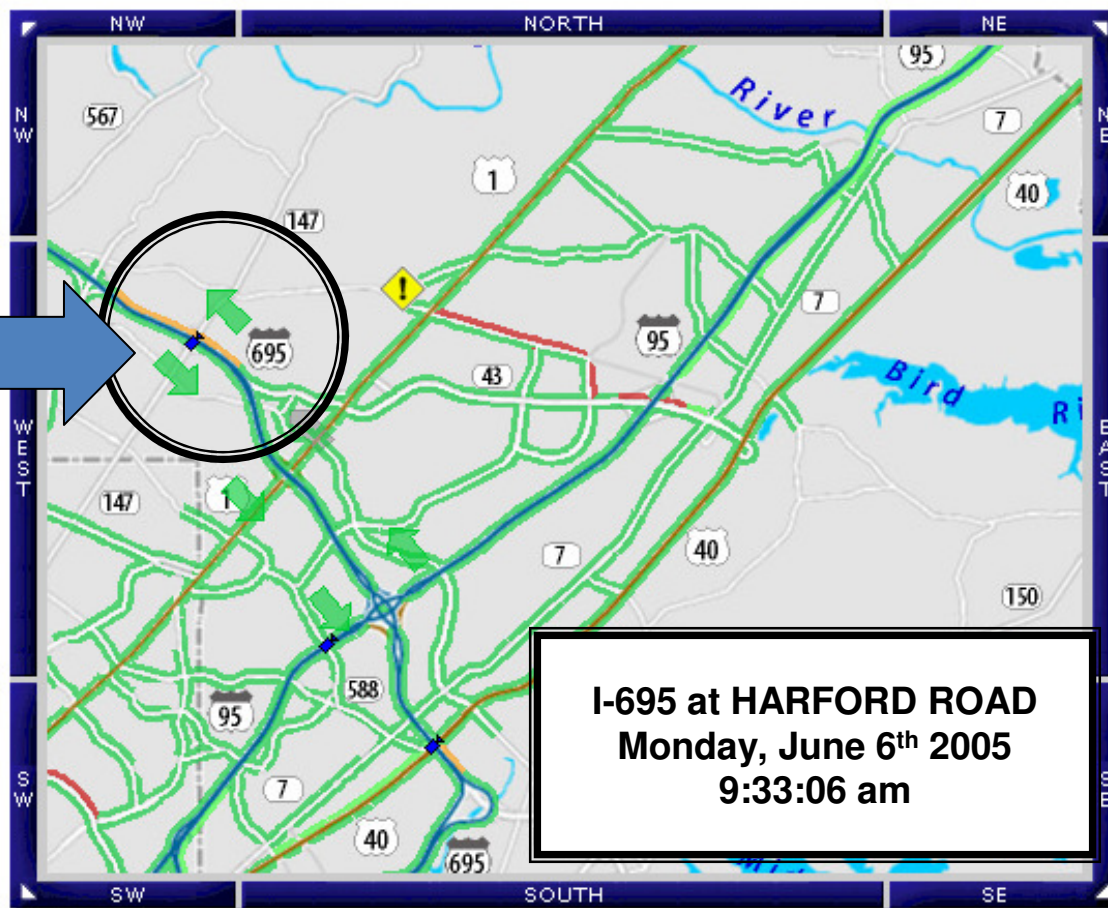
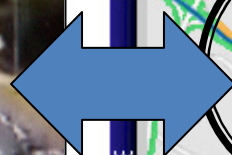
Camera

CMS

Log Out

Baltimore Overview | I-95 Balt / Tunnels | I-95 - NE Balt | I-95 / I-695 NE | I-695 - NW Balt

Map



I-695 at HARFORD ROAD
Monday, June 6th 2005
9:33:06 am

Legend

Traffic QoS:

A	> 90%
B	80 - 89%
C	70 - 79%
D	60 - 69%
E	50 - 59%
F	< 50%
No information	

Devices:

- Changeable Message Sign (CMS)
- Camera

Events:

- Incident
- Construction

Last Speed Update

Mon, Jun 6 9:33:06 AM

Zoom Control



View Choices

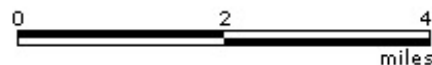
Save View



CMS



Cameras

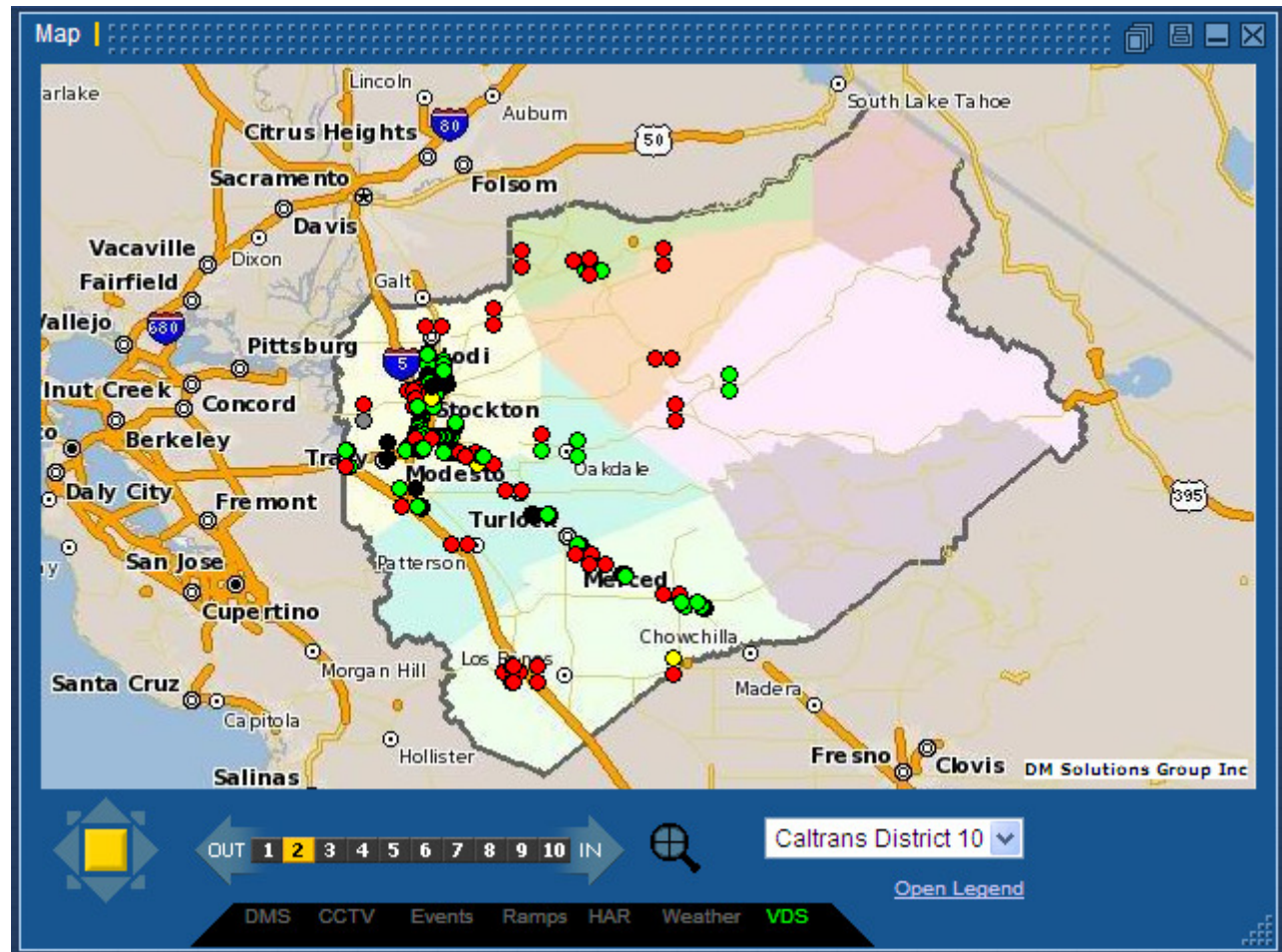




Caltrans District 10

**Interfaces with
190 different
sensors using
InfoTek Wizard**

- Inductive Loops (ILDA)
- RTMS
- Wavetronix
- TIRTL





Flow Data Dissemination

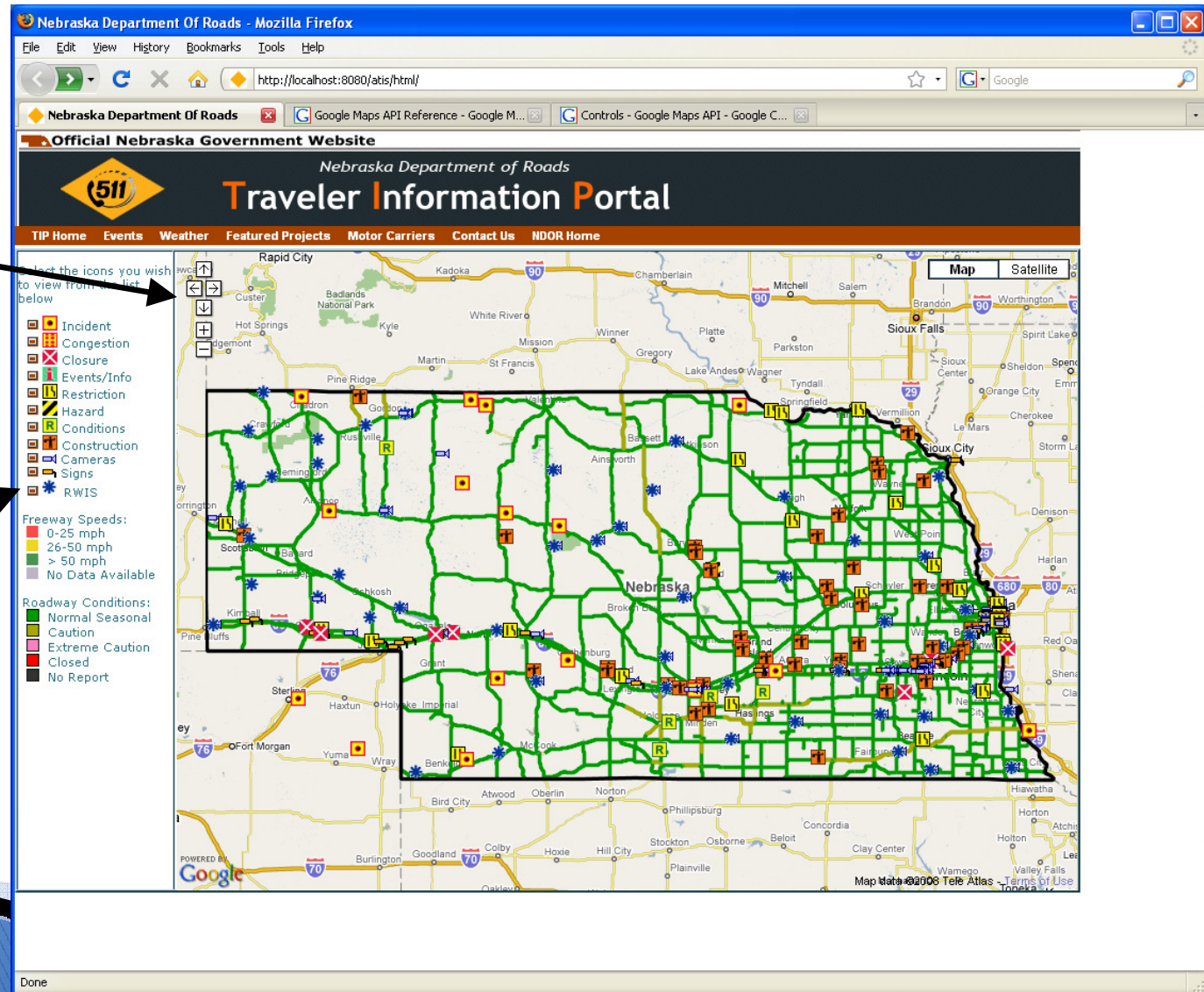
- ▶ Three (3) means
 - ATIS/511 Websites
 - XML Web Services data feeds
 - (Delcan is doing this for San Diego, LA, Nebraska, Illinois, New Hampshire, Oregon, Georgia and soon San Francisco and Oakland)
 - Real Time Travel Time Dissemination (e.g. DMS display)



ATIS/511 Websites

Google Maps Engine

Toggle Layers





ATIS/511 Websites

**Current
Roadway
Sign
Messages
and
Status**

Nebraska Department Of Roads - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://localhost:8080/atis/html/

Nebraska Department Of Roads Google Maps API Reference - Google M... Controls - Google Maps API - Google C...

Official Nebraska Government Website

Nebraska Department of Roads

Traveler Information Portal

TIP Home Events Weather Featured Projects Motor Carriers Contact Us NDOR Home

Select the icons you wish to view from the list below:

- ☐ Incident
- ☐ Construction
- ☐ Closure
- ☐ Events/Info
- ☐ Restriction
- ☐ Hazard
- ☐ Conditions
- ☐ Construction
- ☐ Cameras
- ☐ Signs
- ☐ RWIS

Freeway Speeds:

- 0-25 mph
- 26-50 mph
- > 50 mph
- No Data Available

Roadway Conditions:

- Normal Seasonal
- Caution
- Extreme Caution
- Closed
- No Report

Message Sign
I-80E @ 1.6 miles West of Sidney

ACCIDENT AHEAD
LEFT 2 LANES
CLOSED

Updated: 10/22/2008 12:29 PM

Nebraska

Map Satellite

Map data © 2008 Tele Atlas

Done



Contact Info:

Dan Lukasik, P.E.
Division VP
Delcan Corporation
714-562-5725 x202
d.lukasik@delcan.com

Delcan Proprietary

